

By E. C. M. HAES*

The recently published *The Butterflies of Scotland* by George Thomson demonstrates the need for naturalists of all disciplines to consider Scottish highland natural history as that of a separate island rather than simply the cooler end of Britain. As Thomson makes clear, the Clyde and Forth estuaries almost met about the time of the last post glacial climatic optimum, when the sea levels of Europe were at their recent maxima, while dense forest covered most of the fertile lowlands.

There are too few orthoptera native to Britain to provide such clear evidences of faunistic distinctions as are to be found in Scottish highland Lepidoptera or Hymenoptera: no truly arctic/alpine grasshoppers, such as *Melanoplus frigidus* (Boheman) to match say *Erebia epiphron*, Knoch, Small mountain ringlet butterfly or the wood ant *Formica aquilonia*, Yarrow, have been discovered. On the other hand it is possible that the few Orthoptera species which occur in the Highland Zone have been isolated for long enough to have formed distinct races — although no work has yet been done to establish this. Sufficient is however known about the distribution of the five species of Orthoptera so far recorded in the Highland Zone to justify some notes and observations.

The contemporary Scottish climate is not ideal for orthopterous insects but various species presumably became established quickly during the relatively warm and dry Boreal Period and a handful of the least demanding have held on there until the present day.

Perhaps *M. frigidus* and *Tetrix undulata* (Sowerby), common ground-hopper, were amongst the first post glacial Orthoptera. The latter is widespread in the Highlands to this day but there is so far no evidence that *Melanoplus* has certainly occurred in post-glacial Britain. However the Boreal Period with warm dry summers and the fact that Britain was not yet an island make the assumption of its presence quite reasonable. It is also very likely that extensive marshy areas supported colonies of *Stethophyma grossum* (L.) large marsh grasshopper and *Chorthippus albomarginatus* (De Geer) lesser marsh grasshopper, since both these wetland grasshoppers, together with *Tetrix subulata* (L.) slender ground-hopper, occur in Ireland and were thus almost certainly early post-glacial arrivals. The spread of forest in the Atlantic Period and subsequent deterioration of summer climate in more recent times doubtless eventually exterminated them in the Highland Zone although it would still be worth careful search for all three species, particularly the last in the many squares which remain unsearched for Orthoptera in Scotland.

At least one further orthopteron, *Gryllotalpa gryllotalpa* (L.) mole-cricket, occurred close to the Highland Zone at the end of the last century, in marshy land near Kilmalcolm, Renfrewshire. It too

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may well have been more widespread in Scotland earlier on. It also seems that warmth and sun loving *Tettigonia viridissima* L. great green bush-cricket could have occurred on the east coast in Forfarshire early in the last century, as it was noted here by a very famous and competent botanist, George Don, who also reported the mole cricket from the county.

Of the five species of Orthoptera now known to exist in Highland Scotland *Tetrix undulata* shows no special pattern of distribution and when recorded in Scotland appears to occur in the same variety of habitat as it does in England; woodland clearings, marshy ground and stabilised coastal sand dunes.

The four grasshopper species seem to have rather interesting distribution patterns in the Highland Zone where they are obviously about at the limits of their natural ranges. Three of the four are today virtually absent from the North West Highlands — from around Fort William northwards to the north coast. Of these three *Omocestus viridulus* (L.) the common green grasshopper appears to go high into the hills with regularity. In the Breadalbane mountains around Meall nan Tarmachan and Ben Lawers it attains over 900m. Through the Central and Eastern Highlands and at lower altitude this familiar grasshopper with its relatively loud ticking stridulation is common in almost every sheltered sun trap, stream bed or lowland pasture. Small, colourful *Myrmeleotettix maculatus* (Thunberg) the mottled grasshopper has an almost similar outline distribution to that of the common green in the Highland Zone, but does not seem to occur much over 500 metres and is most numerous on porous heathery ground. It is also the only species of grasshopper at all widespread on coastal sand dunes in the far north and is widespread to the north-eastern tip of Scotland as well as on the machirs of the Outer Hebrides, but apparently quite absent from Skye or the dunes of the north-west mainland.

Most local of the four is *Chorthippus brunneus* (Thunberg) the common field grasshopper with only one or two known colonies inland in the Central and Eastern Highlands and a few scattered colonies on coastal dunes. On the east coast it occurs as far north as Culbin Forest where it is common, but is not known farther north. On the west coast there are very isolated colonies in Kintyre, Mull, Raasay and Scalpay, but it has not so far been found anywhere on Skye nor on the mainland of the north-west. It is almost certainly at its extreme limit of existence in Highland Scotland. On the other hand flightless *C. parallelus* (Zetterstedt) the meadow grasshopper is the one grasshopper to occur commonly in the North West Highlands, although so far unrecorded from the Outer Hebrides. It is known from one place in the Orkneys and in Central Scotland ascends almost as high as the common green. It is for example locally common by the information kiosk in the Ben Lawers National Trust for Scotland Reserve, some 830 metres up the side of Beinn Ghlas. In the far north-west it seems to be very frequent along the newly widened A838, A894, A837 and other roads in the region. Possibly the widening of these tourist routes has enabled this highly adaptable species to spread from hitherto separated

river valley or marshland colonies to exploit the grassy road verges that now cross what was until recently relatively grassless, rainswept moorland. All colour variations including the bright purple femal have been found easily in the region, although the long winged f. *explicatus* is not yet recorded. One further point of interest worth mentioning is that all four grasshoppers in the Highland Zone appear to mature very early with the same early maturity (mid June onwards) as is more normal in the South of England. Presumably the long days of May and June in the Far North encourage this early maturity. It is to be hoped that these notes will stimulate further interest in our highland Orthoptera as this may well be the location for discovering essential details about the species present.

Finally, it may be worth speculating whether or not further species could occur in the region. Certainly there are no other common and widespread species. As has been suggested, *T. subulata* might be found in marshy ground in warm areas and the nocturnal oak bush-cricket *Meconema thalassinum* (De Geer) could be worth searching for in the old oak woods of the West Highlands around Loch Lomond or towards the coast where the purple hairstreak butterfly, *Quercusia quercus* L. occurs. Lepidopterists with light traps are the most likely entomologists to come across this insect in more remote areas. Another faint possibility is the presence of that elusive grasshopper *Stenobothrus stigmaticus* (Rambur). Any really small but fully winged grasshopper of 12 millimetres length or less is worth closest scrutiny and a voucher specimen to the British Museum Natural History.

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EUPITHECIA PHOENICEATA RAMBUR: CYPRESS PUG IN ESSEX.
— On the night of 16th September 1981, I caught a specimen of this moth in my garden at Tilbury. This is the second record of this species for Essex, the first for South Essex. — C. C. PENNEY, 39 Chaucer Close, Tilbury, Essex.